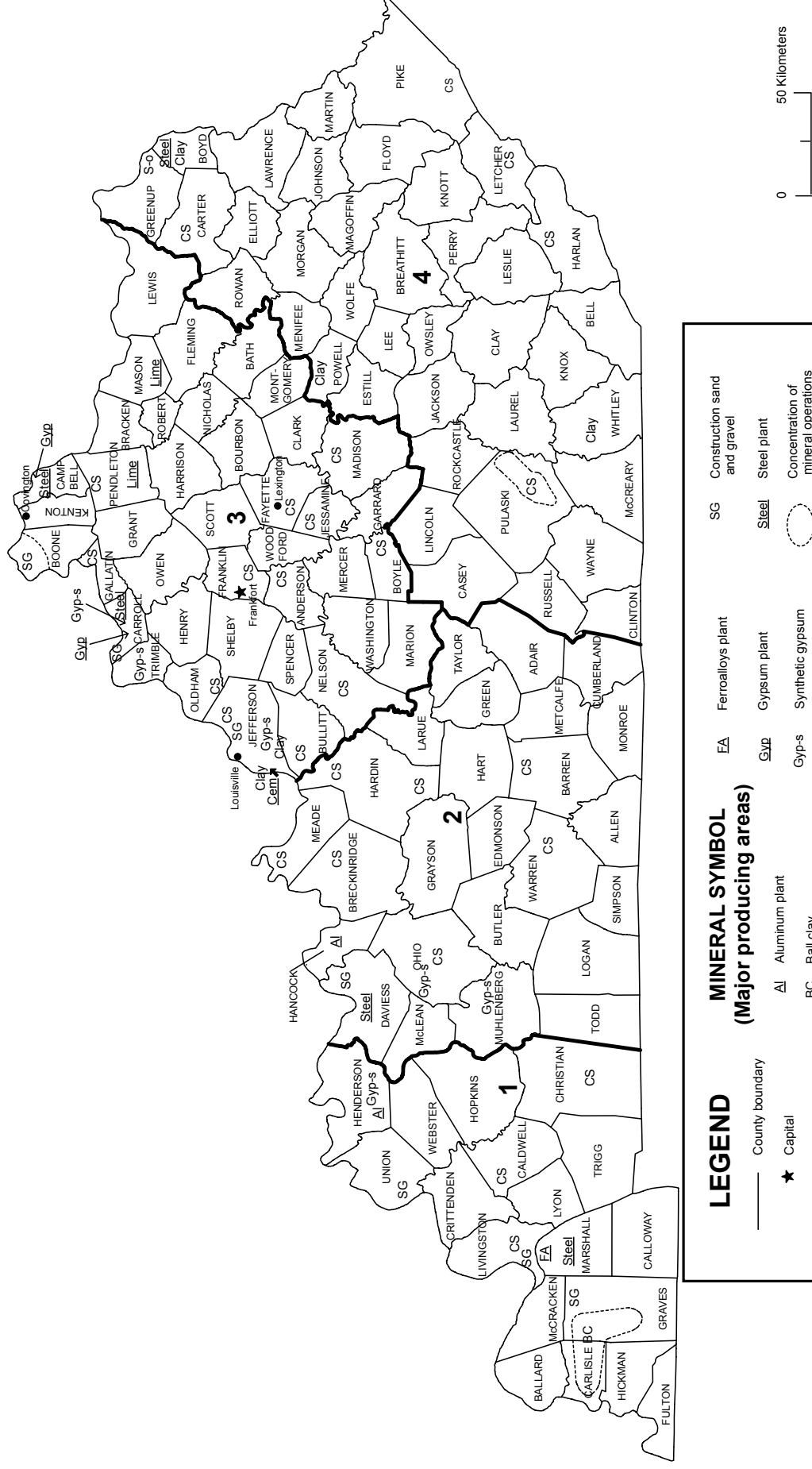


# KENTUCKY



# THE MINERAL INDUSTRY OF KENTUCKY

**This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Kentucky Geological Survey for collecting information on all nonfuel minerals.**

In 2004, Kentucky's nonfuel raw mineral production was valued<sup>1</sup> at \$648 million, an 8.5% increase from that of 2003, based upon annual U.S. Geological Survey (USGS) data. This followed a 10.1% increase in 2003<sup>2</sup> from that of 2002, based upon annual data. Kentucky was 25th in rank (24th in 2003) among the 50 States in total nonfuel mineral production value, accounting for nearly 1.5% of the U.S. total.

Crushed stone continued to be Kentucky's leading nonfuel mineral commodity in 2004 and accounted for about 54% of the State's raw nonfuel mineral production value. Lime was second, followed by cement (portland and masonry) and construction sand and gravel. These four mineral commodities accounted for about 98% of the State's total nonfuel mineral value. In 2004, there were increases in the production and values of lime, value up more than \$25 million, crushed stone, up \$21 million, and cement and construction sand and gravel, up more than \$3 million each. The only decrease in value was for ball clay, down about \$4 million.

In 2003, the production and values increased for crushed stone, value up \$24 million, lime, up about \$16 million, construction sand and gravel, up nearly \$9 million, portland cement, up about \$5 million, and ball clays, up nearly \$3 million (table 1). Although small relative to these, decreases took place in the values of masonry cement, common clays, and gemstones (descending order of change).

In 2004, Kentucky rose to 2d from 3d in the quantity of lime that was produced in the State, dropped to 4th from 3d of the four ball-clay-producing States, and dropped to 11th from 9th in common clays. Additionally, the State produced significant quantities of crushed stone, portland cement, and construction sand and gravel (descending order of value). Primary aluminum and raw steel were produced from materials obtained from other domestic and foreign sources. Kentucky remained the Nation's leading producer of primary aluminum.

Based upon 2004 USGS annual nonfuel mineral production data, Kentucky ranked 19th in the Nation in its minerals industry's value of nonfuel mineral production per capita; having a population of nearly 4.2 million, the State's per capita value of nonfuel mineral production was \$155. The following narrative information was provided by the Kentucky Geological Survey<sup>3</sup> (KGS).

## Exploration and Development Activities

In 2003, diamond exploration took place in the Western Kentucky Fluorspar District when Marum Resources Inc. (2003§<sup>4</sup>) purchased an option from Resource Finance and Investment Limited to conduct a 4-year exploration program around the Coefield Magnetic Anomaly (also called the Lollipop) in Crittenden County. The area near Coefield Creek in Crittenden County is a host for a large ultramafic intrusive complex that had been poorly explored, and Marum planned to conduct coring, petrographic, and caustic dissolution analysis to look for diamonds. Many of these dikes are considered lamprophyres, although some have been reported to be kimberlite dikes. Marum sampled what they determined to be kimberlite dikes and conducted analysis for diamonds, but reported that no diamonds were found. Zinc and fluorite mineral exploration has also been conducted in the area, and zinc mineralization may be related to dike formation, but there has been no mining activity. Currently, KGS is conducting a research program in the area to study the complex ultramafic bodies and their relationship to mineralization.

Many operations in the State were expanding laterally as their reserves diminished, forcing many operators into legal action as opposition to expansion continued. Some quarries began to mine underground to increase reserves. Other operations looked at adding other products to their operations such as blacktop or lime plants.

## Commodity Review

The Vulcan Materials Co.'s Grand Rivers Quarry in Livingston County was the State's leading producing quarry. Based upon 2004 USGS annual production data, the Grand Rivers Quarry ranked as the seventh largest quarry in order of output of crushed stone in the United States. The central Kentucky region (crushed stone/sand and gravel district 3) continued to lead the State in total aggregate value and production because of the increasing demand in urban and industrial markets.

The Rogers Group Inc. acquired the Rock Springs Quarry in Oldham County from Liter's Quarry during the year as a part of their regional expansion (Markley, 2004). The Rock Springs Quarry had just won a legal battle that allowed them to expand operations near the city of Louisville by virtue of their conditional use permit.

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<sup>1</sup>The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2004 USGS mineral production data published in this chapter are those available as of December 2005. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—also can be retrieved over the Internet at URL <http://minerals.usgs.gov/minerals>.

<sup>2</sup>Values, percentage calculations, and rankings for 2003 may differ from the Minerals Yearbook, Area Reports: Domestic 2003, Volume II, owing to the revision of preliminary 2003 to final 2003 data. Data and rankings for 2004 are considered to be final and are not likely to change significantly.

<sup>3</sup>Warren H. Anderson, Geologist and Principal Investigator with the Kentucky Geological Survey, submitted the text of the State mineral industry information provided by that agency.

<sup>4</sup>A reference that includes a section mark (§) is found in the Internet Reference Cited section.

## **Legislation and Government Programs**

Transportation and weight limits for natural resource haulers became the biggest issue during 2004. The Kentucky Legislature submitted a bill to increase weight limits for aggregate and sand trucks on State roads. The bill followed the outgrowth of a lawsuit in an eastern Kentucky court that challenged the current weight limit imposed on natural resource haulers because it differed from the limit of coal haulers. The current weight limit for hauling sand, gravel, and aggregate is 36 metric tons (t). Some road builders and truckers have lobbied to allow minerals other than coal to be transported at the same weight limits as coal, or 54 t, with an extended weight permit. Many city and county leaders, environmentalists, and truckers opposed the bill. In March 2005, a modified version of the bill passed the State Senate, but failed in the House.

In 2004, Kentucky reached a milestone in digital geologic mapping history when all 707 geologic quadrangles maps (7.5-minute, 1:24,000-scale) were completely digitized (from 1996 to 2004). During 2005, KGS is compiling these maps into a set of 30 x 60-minute, 1:100,000-scale maps for public distribution. KGS has begun to release these maps via the KGSGeoPortal, an Internet map server. This Web site allows a user to download various types of geologic data to create custom maps at URL <http://kgsmmap.uky.edu/website/KGSGeoPortal/KGSGeoPortal.asp>.

## **Reference Cited**

Markley, Rick, 2004, Rogers Group buys four quarries: Rock Products, May 1, p. 5.

## **Internet Reference Cited**

Marum Resources Inc., 2003, Press Release, accessed August 28, 2005, at URL [http://www.marumresources.com/id42\\_m.htm](http://www.marumresources.com/id42_m.htm).

TABLE 1  
NONFUEL RAW MINERAL PRODUCTION IN KENTUCKY<sup>1, 2</sup>

(Thousand metric tons and thousand dollars)

Mineral	2002		2003		2004	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays, common	925	4,740	983	3,770	978	4,510
Gemstones	NA	64	NA	22	NA	22
Sand and gravel, construction	9,530	37,900	10,000	46,500	10,300	49,700
Stone, crushed	50,600	302,000	52,400	326,000	55,600	347,000
Combined values of cement, clays (ball), lime	XX	197,000	XX	220,000	XX	246,000
Total	XX	542,000	XX	597,000	XX	648,000

NA Not available. XX Not applicable.

<sup>1</sup>Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

<sup>2</sup>Data are rounded to three significant digits; may not add to totals shown.

TABLE 2  
KENTUCKY: CRUSHED STONE SOLD OR USED, BY KIND<sup>1</sup>

Kind	2002				2003				2004			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone <sup>2</sup>	90	W	W	\$5.99	94	W	W	\$6.20	87	W	W	\$6.23
Dolomite	1	W	W	5.24	1	W	W	7.35	1	W	W	6.80
Total or average	XX	50,600	\$302,000	5.97	XX	52,400	\$326,000	6.22	XX	55,600	\$347,000	6.24

W Withheld to avoid disclosing company proprietary data; included in "Total or average." XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes limestone-dolomite reported with no distinction between the two.

TABLE 3a

KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1½ inch):			
Riprap and jetty stone	183	\$1,300	\$7.08
Filter stone	235	1,510	6.43
Other coarse aggregates	1,670	10,000	5.99
Total or average	2,090	12,800	6.13
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,900	13,100	6.88
Bituminous aggregate, coarse	2,680	20,400	7.58
Bituminous surface-treatment aggregate	683	5,010	7.33
Railroad ballast	W	W	7.28
Other graded coarse aggregates	6,450	47,100	7.31
Total or average	11,700	85,600	7.30
Fine aggregate (-¾ inch):			
Stone sand, concrete	(2)	(2)	8.47
Stone sand, bituminous mix or seal	406	2,950	7.26
Screening, undesignated	1,250	5,030	4.02
Other fine aggregates	1,810	12,200	6.75
Total or average	3,470	20,200	5.82
Coarse and fine aggregates:			
Graded road base or subbase	3,540	26,800	7.56
Unpaved road surfacing	562	3,620	6.44
Crusher run or fill or waste	534	3,470	6.49
Other coarse and fine aggregates	2,350	15,900	6.77
Total or average	6,980	49,700	7.12
Agriculture limestone	726	4,080	5.62
Chemical and metallurgical, lime manufacture	(3)	(3)	8.78
Special, asphalt fillers or extenders	(3)	(3)	7.28
Unspecified: <sup>4</sup>			
Reported	15,900	79,800	5.02
Estimated	7,300	37,000	5.03
Total or average	23,200	117,000	5.02
Grand total or average	52,400	326,000	6.22

W Withheld to avoid disclosing company proprietary data; included with "Other graded coarse aggregates."

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

<sup>3</sup>Withheld to avoid disclosing company proprietary data; included in "Grand total or average."

<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 3b

KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE<sup>1</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1½ inch):			
Macadam	W	W	\$6.28
Riprap and jetty stone	218	\$1,910	8.75
Filter stone	172	1,110	6.42
Other coarse aggregates	1,560	9,960	6.39
Total or average	1,950	13,000	6.66
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,740	12,500	7.20
Bituminous aggregate, coarse	2,940	23,200	7.87
Bituminous surface-treatment aggregate	692	4,950	7.15
Other graded coarse aggregates	5,580	40,800	7.30
Total or average	11,000	81,400	7.43
Fine aggregate (-¾ inch):			
Stone sand, concrete	(2)	(2)	8.21
Stone sand, bituminous mix or seal	897	8,770	9.77
Screening, undesignated	359	2,310	6.43
Other fine aggregates	2,050	13,300	6.48
Total or average	3,310	24,400	7.37
Coarse and fine aggregates:			
Graded road base or subbase	3,730	26,600	7.13
Unpaved road surfacing	97	642	6.62
Crusher run or fill or waste	329	2,320	7.04
Other coarse and fine aggregates	5,310	36,900	6.96
Total or average	9,460	66,500	7.02
Agriculture limestone	397	2,050	5.17
Unspecified: <sup>3</sup>			
Reported	16,500	82,400	4.98
Estimated	13,000	78,000	5.96
Total or average	29,600	160,000	5.41
Grand total or average	55,600	347,000	6.24

W Withheld to avoid disclosing company proprietary data; included with "Other coarse aggregates."

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Withheld to avoid disclosing company proprietary data; included with "Other fine aggregates."

<sup>3</sup>Reported and estimated production without a breakdown by end use.

TABLE 4a  
KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2003, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W	W	W	236	1,590
Coarse aggregate, graded <sup>3</sup>	W	W	2,330	15,900	5,860	44,300	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	W	W	1,580	7,700	284	2,090
Coarse and fine aggregate <sup>5</sup>	W	W	1,080	6,920	4,110	29,100	W	W
Agricultural <sup>6</sup>	12	164	W	W	W	W	44	231
Chemical and metallurgical <sup>7</sup>	--	--	--	--	W	W	--	--
Special <sup>8</sup>	--	--	W	W	--	--	--	--
Unspecified: <sup>9</sup>								
Reported	3,720	20,400	2,670	10,400	2,450	11,700	7,060	37,300
Estimated	67	350	2,100	11,000	2,500	13,000	2,600	13,000
Total	10,100	63,000	9,600	53,400	21,400	146,000	11,400	63,200

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes filter stone, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), railroad ballast, and other graded coarse aggregates.

<sup>4</sup>Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.

<sup>5</sup>Includes crusher run (select material or fill), graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone.

<sup>7</sup>Includes lime manufacture.

<sup>8</sup>Includes asphalt fillers or extenders.

<sup>9</sup>Reported and estimated production without a breakdown by end use.



TABLE 4b  
KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2004, BY USE AND DISTRICT<sup>1</sup>

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction:								
Coarse aggregate (+1½ inch) <sup>2</sup>	W	W	W	W	770	5,110	W	W
Coarse aggregate, graded <sup>3</sup>	W	W	2,880	21,000	4,770	36,400	W	W
Fine aggregate (-¾ inch) <sup>4</sup>	W	W	1,360	12,200	800	5,420	W	W
Coarse and fine aggregate <sup>5</sup>	W	W	W	W	7,050	49,800	W	W
Agricultural <sup>6</sup>	W	W	W	W	131	763	W	W
Unspecified: <sup>7</sup>								
Reported	5,940	32,200	2,760	10,700	2,510	12,000	5,330	27,500
Estimated	120	600	2,300	12,000	7,400	43,000	3,200	22,000
Total	12,000	73,800	10,600	65,000	23,400	152,000	9,630	56,300

W Withheld to avoid disclosing company proprietary data; included in "Total."

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregates.

<sup>3</sup>Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), and other graded coarse aggregates.

<sup>4</sup>Includes screening (undesignated), stone sand (bituminous mix or seal), stone sand (concrete), and other fine aggregates.

<sup>5</sup>Includes crusher run or fill or waste, graded road base or subbase, unpaved road surfacing, and other coarse and fine aggregates.

<sup>6</sup>Includes agricultural limestone.

<sup>7</sup>Reported and estimated production without a breakdown by end use.

TABLE 5a  
KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2003,  
BY MAJOR USE CATEGORY<sup>1, 2</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	6,240	\$31,900	\$5.11
Asphaltic concrete aggregates and road base materials <sup>3</sup>	305	884	2.90
Unspecified: <sup>4</sup>			
Reported	721	2,950	4.10
Estimated	2,600	10,000	3.88
Total or average	10,000	46,500	4.64

W Withheld to avoid disclosing company proprietary data; included in "Total or average."

<sup>1</sup>To avoid disclosing company proprietary data, no district tables were produced for 2003.

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>Includes fill.

<sup>4</sup>Reported and estimated production without a breakdown by end use.

TABLE 5b  
KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2004,  
BY MAJOR USE CATEGORY<sup>1, 2</sup>

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	6,310	\$33,300	\$5.27
Asphaltic concrete aggregates and road base materials	108	652	6.06
Fill	272	1,010	3.71
Unspecified: <sup>3</sup>			
Reported	1,320	5,250	3.98
Estimated	2,300	9,500	4.14
Total or average	10,300	49,700	4.82

<sup>1</sup>To avoid disclosing company proprietary data, no district tables were produced for 2004.

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>Reported and estimated production without a breakdown by end use.